The emergence of the pronouns Dutch *er* and French *en* in child L1 and the role of complexity

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The purpose of this research is to explore the emergence of several types of ER pronouns (Dutch) and EN pronouns (French) in L1 acquisition from both a language-internal and cross-linguistic perspective, and to identify the role of syntactic complexity (based on Jakubowicz' Derivational Complexity Metric) in this acquisition process. The analysis of spontaneous speech data reveals substantial temporal differences in the emergences of pronominal constructions, both language-internally and cross-linguistically. This study shows that the emergence patterns can be properly accounted for by applying the Derivational Complexity Metric to the spontaneous child data we collected.

Keywords: L1 acquisition, syntax, complexity, pronouns

1.   Introduction

Creating sentences while applying the correct morpho-syntactic rules is intrinsically an intuitive process in adult language use. Speakers generally do not think about sentence structure while conversing, but do subconsciously possess the linguistic competence required to adequately map thoughts onto the appropriate structures and lexical items. However, this linguistic competence might be different in child language. Our study exposes a segment of this yet unknown territory by taking a closer look at the emergence of pronouns in early monolingual language acquisition and the role complexity plays in this. We focus specifically on two pronouns with comparable functions in the two languages: the Dutch pronoun *er* and the French pronoun *en*, henceforth referred to as such. Though production of these pronouns in early child language is mentioned in some previous work (Van Hout et al., 2010; Gavarró et al., 2010; Sleeman and Hulk, 2013; Van Dijk and Coopmans, 2013), to our knowledge, no language-internal or cross-linguistic study exists that investigates *er* and *en* in multiple usages. Investigation of these usages is nonetheless critical in this discussion as they suggest that these forms embed different types of pronouns that although homophonous, involve different derivations. These homophonous types of pronouns appear to carry different syntactic complexity loads, which we believe influence their order of emergence.

In this contribution, we first give a synopsis of the different syntactic properties that the Dutch pronoun *er* and the French pronoun *en* can have (section 2). We subsequently

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review the most relevant literature with respect to the acquisition process of these specific pronouns (section 3), and explore what a syntactic approach, namely *syntactic complexity*, would predict for the order of emergence of these pronouns (section 4). After describing the methodology (section 5) we build upon the findings of previously conducted studies and fill a gap in the literature by reporting the data of our innovative and exploratory corpus-based study (section 6). The discussion is a broader exploration of the role of syntactic complexity on pronoun use (section 7). We end this article with some concluding remarks (section 8).

2.   The syntactic functions of *er* and *en*

Dutch and French have multiple types of *er* and *en*, all with their own syntactic, lexical and semantic complexity. Only syntactic complexity will be taken into account here; formalisation of the lexical and semantic complexity differences of the constructions under investigation falls outside the scope of this article. For information regarding these other types of complexity we refer the reader to Bennis (1986) for Dutch and to Sleeman (1996) for French.

Table 1 presents the different functions the Dutch pronoun *er* and the French pronoun *en* can have (Bennis 1986; Van Riemsdijk 1978; Van der Wouden 1995; Hulk 1982; Sleeman 1996).[1,2]

Dutch		
(i)	expletive	subject in passive constructions with the auxiliary verb *worden* 'to be'
		er wordt gedanst
		ER is being danced
		'there is dancing going on'
(ii)	existential	provisional subject (with the real subject following later in the sentence)
		er hipt een vogel in de tuin
		ER hops a bird in the garden
		'a bird hops in the garden'
(iii)	prepositional[3]	complement of a preposition, e.g., *erin* 'in', *erop* 'on', *eruit* 'out'
		zij heeft het glas erin gezet
		she has the glass ERin put
		'she has put the glass in it'
(iv)	quantitative	part of a complex NP modified by a numeral or weak quantifier
		ik heb er zes gezongen
		I have ER six sung
		'I have sung six'

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[1] In French, *en* can also be a real preposition, besides pronominal *en*: *en l'air*, 'in the air'. The preposition *en* is not included in this article.

[2] For a more detailed discussion of the different properties of *er*, we refer the reader to Bech (1952), Kirsner (1979) or Grondelaers (2009).

[3] Prepositional *er* is underlyingly the complement of a preposition, while *er* + preposition can be the complement of a verb, an adjective or a noun. We use the traditional term 'Prepositional *er*', as introduced by Bennis (1986), although *er* does not replace a preposition or a PP.

(v)	locative	substitute for *daar* 'there'
		het meisje woont er al lang
		the girl lives ER already long
		'the girl lives there for a long time'
(vi)	expression	part of a fixed expression
		je bent me er eentje
		you are me ER one
		'you are quite a character'

French		
(i)	prepositional[4]	substitute of *de* 'of' + complement
		j'en parle
		I EN talk
		'I talk of it'
(ii)	quantitative	part of a complex NP modified by a numeral or weak quantifier
		il en a lu trois
		he EN has read three
		'he has read three'
(iii)	expression	part of a fixed expression
		j'en ai marre
		I EN have enough
		'I have had enough'

Table 1. Different syntactic functions of *er* and *en*.

Table 1 reveals that different syntactic functions can be attributed to pronominal *er* and *en*; expletive pronouns, existential pronouns and pronouns that occur as part of a fixed expression have an autonomous function, whereas prepositional pronouns, locative pronouns and quantitative pronouns are considered anaphoric stand-ins that need to be bound by an antecedent in the preceding discourse. Also, at first glance it looks as if all types of French *en* constructions have Dutch *er* equivalents, but disparities regarding these seemingly similar constructions exist. One of these disparities concerns the prepositional pronouns, henceforth referred to as P-*er* for Dutch and P-*en* for French. P-*er* pronominalises the inanimate nominal complement of any preposition in the PP and can consequently combine with many different prepositions, as in e.g., *erover* 'over', *erop* 'on', *erin* 'in', *erlangs* 'to the side', whereas P-*en* always substitutes the whole prepositional phrase *de* 'of' + DP in which the complement is also inanimate.[5] See examples (1a) and (1b).

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[4] The terms 'genitive *en*' and 'partitive *en*' are also used. However, for comparison reasons we stick to the term 'prepositional *en*', which corresponds with the Dutch counterpart *ervan* 'of' and *erover* 'about'. Just as in Dutch, P-en can be subdivided into the complement of a verb, an adjective or a noun, all replacing a DP introduced by *de* 'of'. For Q-en it is generally assumed that it replaces the NP "head" of the DP (Hulk 1982).

[5] In colloquial language, P-*er* is used to pronominalise some animate complements, e.g., *ik heb ermee gepraat* 'I have talked with it/him/her', *zie je die persoon? ik heb erachter gelopen* 'Do you see that person? I walked behind him/her'.

(1)   a.   *Ik droom erover*   b.   *J'en rêve*

                I dream *er*of   I *en* dream

                'I dream of it'   'I dream of it'

Correspondingly, in Dutch the preposition is still present after pronominalisation has taken place (1a), whereas in French it is not (1b).[6] French P-*en* is essentially comparable to its Dutch counterpart *ervan* 'of' and *erover* 'about'. In the context of other French prepositions (e.g., *à* 'in, to', *dans* 'in', *sur* 'on') taking an inanimate complement, the prepositional phrase is replaced by the pronoun *y*, as in the French equivalent of the Dutch example (2). An analysis of *y* is beyond the scope of this paper.

(2)   Ik denk eraan → J'y pense

          'I think about it'

The fact that P-*en* is bound to be associated with *de* 'of', while P-*er* may appear with various prepositions, leads to the assumption that P-*er* is more widespread in Dutch than P-*en* in French.

        Quantitative *er* and quantitative *en*, hereinafter referred to as Q-*er* and Q-*en*, respectively exhibit some different distributive properties too. In both languages the quantitative pronoun is syntactically part of a complex noun phrase modified by a cardinal numeral or weak quantifier in an indefinite NP in object position. However, if the remnant of an elided noun contains an adjective, a quantitative pronoun can appear in French (Bouchard 2002), but not in Dutch. Accordingly, the French example (3a) is grammatical, but not the Dutch equivalent in (3b).

(3)   a.   *Elle en a choisi deux rouges*   b.   * *Zij heeft er twee rode gekozen*

                she *en* has chosen two red   she has *er* two red chosen

                'She has chosen two red ones'   'She has chosen two red ones'

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[6] Despite the fact that *en*-replacements result in the absence of the actual preposition, *en* is called a prepositional complement because the presence of a preposition in the original PP is essential.

In the following section we review some studies that concentrated on the emergence or developmental processes of Dutch *er* pronouns and/or French *en* pronouns, and are relevant for the discussion here.

3.   The acquisition of *er* and *en*

Of the limited number of studies that have focused on *er* and *en* pronouns in L1 language development, some have taken an experimental approach while others looked at spontaneous speech files.

Van Hout et al. (2010) experimentally examined the production of Q-*er* pronouns in five-year-old Dutch children, while Gavarró et al. (2010) did the same for Q-*en* pronouns in five-year-old French children. Both studies comprised an elicited speech production task and an elicited imitation task. In the elicited speech production task, the Dutch children and the French children produced approximately the same amount of target-like utterances: 36% for Dutch and 35% for French. It is remarkable that even though this pronoun was produced sparsely in both languages, if it was used, its use was syntactically correct. The infrequent use was a result of the pronoun being subject to optional omission (D:10%, F:5%), usage of the full NP (D:49%, F:52%), or other (D:5%, F:8%). Nonetheless, if one compares the outcomes of the elicited imitation task in the two languages, a discrepancy appears: more French children master this specific construction than their Dutch peers. The Dutch elicited imitation task yielded 81% target-like responses, while the French tasks resulted in 98% for target-like responses.

Taking a different approach, Sleeman and Hulk (2013) analysed a small number of spontaneous speech files in Dutch and French, in which they looked at the age of emergence of nominal ellipsis constructions without a numeral remnant, see (4), and compared these with the age of emergence of Q-*er* and Q-*en* constructions that occurred in the same speech files.

(4)   a.   *Ik kies de rode*   b.   *Je choisis la rouge*

I choose the red   I choose the red

'I choose the red one'   'I choose the red one'

The authors selected a limited number of spontaneous speech production files from five monolingual French children (aged between 1;8 and 3;0) and five monolingual Dutch children (aged between 1;8 and 3;6) from the CHILDES database (MacWhinney 2000). The French files were part of the Lyon (Demuth and Tremblay 2008) and Paris (Morgenstern and Parisse 2007) corpora. The Dutch files were part of the Groningen (Bol 1995) and Van Kampen (Van Kampen 1994) corpora. The authors discovered that although the emergence of regular nominal ellipsis happens at the same time in French and Dutch children – it emerges in both groups around the age of 1;8 – Dutch Q-*er* emerges at a significant later age (around 2;4 years) than French Q-*en* (around 1;11 years), thereby emphasizing a cross-linguistic difference regarding Dutch and French L1 development of constructions with q-pronouns.

The results from these previous studies suggest that French children are earlier and more advanced in the production of *en* pronouns in early childhood compared to *er* pronouns in Dutch children, but the existing evidence is limited. Because only Q-*er* and Q-*en* were included in these analyses, we know nothing about the ranking of the emergence of q-pronouns in comparison with the emergence of homophonous types of *er* and *en* (as described in Table 1). To the best of our knowledge, no study reports on this for French (yet), and only a basic, initial study has been conducted for Dutch. This was done by Van Dijk and Coopmans (2013), who looked at the age of emergence of various types of Dutch *er*: expletive, locative, prepositional, and quantitative. A total of 150 spontaneous speech files of five young children from the Groningen corpus (Bol 1995) from the CHILDES database, aged between 1;8 and 3;7 years, were analysed. The investigators discovered that the prepositional pronoun emerges prior to all other *er* pronouns. Subsequently the quantitative pronoun follows, and approximately more than a year after the first emergence of P-*er* sparse instances of locative *er* are found. Expletive *er* emerges at different ages in the different children. Hence, the emergence of *er* in Dutch can be described in this sequence (5).

(5)   prepositional < (expletive) < quantitative < (expletive) < locative

In conclusion, four studies have looked at the emergence and production of *er* and *en* pronouns: all of them being remarkably limited in their scope. We build upon the aforementioned studies by providing a broader picture regarding the emergence of Dutch *er*

pronouns and French *en* pronouns. We add to the work by Van Dijk and Coopmans (2013), Van Hout et al. (2010), Gavarró et al. (2010), Sleeman and Hulk (2013) in three ways by: (i) including a large(r) number of spontaneous speech files, (ii) focusing on the relative complexity of multiple syntactic functions of *er* and *en*, (iii) providing a cross-linguistic perspective, and (iv) making an important distinction between non-adjacent and adjacent prepositional pronouns (an explanation of these terms will be given in the next section).

In the following section we will evaluate syntactic complexity per construction and per language, including the complexity differences between non-adjacent and adjacent prepositional pronouns, which Van Dijk and Coopmans did not address.

4.   Syntactic complexity

In order to account for the cross- and inter-linguistic differences of the emergence pattern of *er* and *en* pronouns, we call upon relative syntactic complexity. It is not within the scope of this article to give an in-depth explanation of syntactic complexity, but informally defined we consider syntactic complexity to be equivalent to the number of merge operations that constituents undergo: if the number of movements of a constituent in a derivation increases, syntactic complexity increases. If syntactic complexity increases, we expect a later age of emergence in child L1 acquisition.[7] Compare a Dutch sentence containing an object pronoun (6) with a Dutch sentence containing a q-pronoun (7).

(6)

| Original | → | Ik zie de knikkers | 'I see the marbles' |
| Step 1 (pronominalisation) | → | Ik zie ze | |

(7)

| Original | → | Ik zie twee knikkers | 'I see two marbles' |
| Step 1 (pronominalisation) | → | Ik zie twee er | |

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[7] There is the idea in the literature (and already present in Chomsky 1995) that movement (i.e., internal merge) is costlier than external merge. Movement being cyclic, each instance of internal merge on the way to the landing site is a costly operation. Thus, movement in one stretch will always be less complex than movement through intervening positions implying deletion of many copies, an operation that Nunes (2004) defines as being costly. We will show that children sometimes do not delete the doubling constituent after copying the pronoun, which provides evidence for Nunes' copy theory of movement (see fn. 13).

Step 2 (movement)   →   Ik zie er twee

In the object pronoun sentence (6) the full NP is pronominalised by the pronoun *ze* 'them': both the determiner and the NP are replaced and no movement is needed and no visible remnant is left behind. In the quantitative pronoun sentence (7), only the N is pronominalised by the pronoun *er,* while a numeral or quantifier is left behind as a remnant of the original noun phrase. Moreover, movement is needed because the q-pronoun cannot stay in its base position.[8] Thus, besides the pronominalisation (step 1) that happens in sentences 6 and 7, only in sentence 7 step 1 has to be followed by step 2, a syntactic movement. Due to the presence of this syntactic movement, we consider this latter construction to be more complex than comparable sentences with object pronouns. Consequently, sentences with q-pronouns are expected to emerge later than sentences with object pronouns due to their higher syntactic complexity load.[9]

Van Hout et al. (2010) confirmed the influence of syntactic complexity in Dutch L1 acquisition, as they found that five-year-old children have a better command of object pronouns than Q-*er* pronouns: fewer omissions were found in the object pronoun task. The original idea that syntactic complexity is equivalent to the number of merges, which in turn influences the emergence of certain constructions, has been brought up by Van Kampen (1997). Hulk and Zuckerman (2000) also claim that if a language allows for different options, young children will initially use the more economical one, i.e. the option that involves less movement. Jakubowicz (2002, 2011) and Soares (2002, 2003) claim that young children prefer external merge over internal merge, external merge being an operation with a lower complexity load. To clarify this claim, Jakubowicz (2005) proposes a metric whereby computational complexity can be precisely defined, the Derivational Complexity Metric, as explained in (8).

(8)   Derivational Complexity Metric (Jakubowicz 2005)

A.   Merging α_i n times gives rise to a less complex derivation than merging α_i (n +

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[8] Different analyses have been proposed in the literature. In a DP analysis it is the NP that is replaced, while in a NP analysis it is the N that is replaced. Important here is that it is not the whole DP, but a subpart.

[9] On this view, constructions involving movement will always emerge later than their non-movement counterparts. So in French *je veux la poupée* 'I want the doll' will precede *je la veux* 'I want it'.

1) times.

B. External Merge of α gives rise to a less complex derivation than Internal Merge of $\alpha + \beta$.

In this metric she does not take into account the number of external merges that are needed to build the whole sentence, neither does she count other internal merges, such as V-to-T movement that could occur in such constructions as well. Jakubowicz and Strik (2008) argue that the Derivational Complexity Metric in (8) is valid, as it correctly describes the relative frequency of interrogative constructions in French L1 acquisition. In their investigation, typically developing French monolingual children (aged three, four, and six) and atypically developing French monolingual SLI children (aged eight and eleven) were tested in an elicited production task on their use of direct interrogatives. The authors found that both SLI groups, as well as typically developing children who were three and four years old, made more use of the (grammatical) in situ pattern in locative and object root questions, in comparison with typically developing children who were six years old, and the control adults. In the in situ pattern the *wh*-phrase is placed in the position where the grammatical object would have been if the assertive sentence was uttered, see (9).

(9) a. *Le poisson nage dans l'eau*   b. *Le poisson nage où?*
         the fish swims in the water   the fish swims where
         'The fish swims in the water'   'Where is the fish swimming?'

Whereas the locative question in (9) only involves external merge of the *wh*-phrase (*n*), the *wh*-movement construction in (10) also requires internal merge of the *wh*-phrase (*n* + 1), making this latter derivation more complex according to the first rule of the Derivational Complexity Metric (8A).

(10)   *Qui   tu   as   vu?*
          who you have seen?
          'Who did you see?'

According to the second rule of the Derivational Complexity Metric (8B), a wh-fronting sentence that contains internal merge of the subject pronoun, i.e. subject inversion (11), which is written as $\alpha + \beta$, is more complex than the sole internal merge of α in (10).

(11)   *Qui   as - tu   vu?*
           who have you seen
           'Who did you see?'

This section illustrates that syntactic movement is costly in children's language production. We will adopt this approach in the following section, in which we will explain in more detail what Dutch (section 4.1) and French (section 4.2) syntactic complexity involves in the case of *er* and *en*.

4.1 Syntactic complexity of *er*

As shown in section 2, there are many types of *er* in Dutch. The focal points in this study are prepositional *er* and quantitative *er* since Dutch and French share these pronouns.

Obligatory movement

There is some obvious overlap between Q-*er* and P-*er* in the sense that both structures involve external merge of the pronoun or pronominalisation (step 1) and that *er* is not allowed to stay in its base-generated position, but instead must move out (step 2) (Kranendonk 2010). See (12) for an example of Q-*er* and (13) for an example of P-*er*.

(12)

Original	→	Hij koopt twee knikkers	'He buys two marbles'
Step 1	→	Hij koopt twee er	
Step 2	→	Hij koopt er twee	

(13)

Original	→	Ik kijk in de doos	'I look in the box'
Step 1	→	Ik kijk in er	
Step 2	→	Ik kijk erin	

These two obligatory steps involve external merge of *er*: the pronominalisation of the full DP. However, this pronominalisation alone does not lead to a grammatical sentence. Therefore, both constructions need to go through step 2, in which *er* is merged internally. For P-*er* this involves movement from the in situ original NP position to the position immediately to the left of the preposition, and for Q-*er* movement from the in situ original NP position to a position left-adjacent to the quantifier. After these two obligatory steps, both sentences are grammatical and acceptable, which leads to the prediction that Q-*er* will emerge at the same time as P-*er*.

Optional movement

Under specific pragmatic conditions, both P-*er* and Q-*er* may undergo extra optional movement that involves one more instance of internal merge. In order for this to happen an extra constituent needs to be inserted in the sentence.

Q-*er*	step 3 →	hij kocht er **gisteren** twee	'He bought two of them yesterday'
P-*er*	step 3 →	ik keek er **gisteren** in	'I looked in it yesterday'

These examples add another characteristic to prepositional and quantitative constructions, namely what we will call *adjacent* and *non-adjacent* constructions. Adjacent constructions entail that *er* immediately precedes the preposition or quantifier, as in *erin* 'in' or *er drie* 'three', while non-adjacent sentences contain an adverb between *er* and its obligatory counterpart, as in *er vaak in* 'often in' and *er morgen drie* 'tomorrow three'.

Based on the Derivational Complexity Hypothesis we predict that all further movement – after the obligatory initial two steps – increases complexity. Because of this increased complexity that comes together with optional movement, we predict the following order of emergence in child language:

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| P1: | adjacent prepositional constructions | < | non-adjacent prepositional constructions[10] |
| | (obligatory movement) | | (optional movement) |

| P2: | adjacent quantitative constructions | < | non-adjacent quantitative constructions |
| | (obligatory movement) | | (optional movement) |

| P3: | P-*er* | = | Q-*er* |

4.2 Syntactic complexity of *en*

The types of French *en* under investigation here are similar to their Dutch counterparts. For one, French P-*en* is considered an anaphoric stand-in that needs to be bound by an antecedent in the preceding discourse in order to identify the syntactic relationship between the two constituents. For another, Q-*en* needs an antecedent and is syntactically part of a complex indefinite noun phrase modified by a numeral or weak quantifier, such as *aucun* 'no' or *plusieurs* 'many'.

Obligatory movement

Since the prepositional complement in French pronominalises both the complement of the preposition and the preposition *de* 'of' itself, no movement inside PP is involved, unlike in Dutch. Instead, only clitic movement to the verbal host is needed, similar to what we see for other anaphoric clitic pronouns. A similarity with Dutch is that *en* is not allowed to appear in situ, but instead has to move. See (14) for an example of Q-*en* and (15) for an example of P-*en*.

(14)

| Original | → | Elle achète parfois deux billes | 'She sometimes buys two marbles' |
| Step 1 | → | Elle achète parfois deux en | |

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[10] In Schippers' dissertation (2012) an intermediate developmental step is described in which children strand a preposition with an accusative pronoun and a full DP, after the adjacent prepositional constructions have emerged and before non-adjacent prepositional constructions that involve *er*-pronouns have emerged. Our study does not involve cases of non-adjacent preposition and pronoun.

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| Step 2 | → | Elle en achète parfois deux |
| | | |

(15)

Original	→	Il parle de ce livre	'He speaks about this book'
Step 1	→	Il parle en	
Step 2	→	Il en parle	

As we saw before for Dutch, step 1 is the pronominalisation of the full NP and step 2 involves movement from the original NP position to the immediate pre-verbal position. After these two obligatory steps both sentences are grammatical and acceptable. Because Q-*en* and P-*en* are of similar derivational complexity, we predict Q-*en* to emerge at the same time as P-*en*.

| P4: | P-*en* | = | Q-*en* |

Optional movement

There is no optional movement in the case of P-*en* and Q-*en*. Adding an extra constituent does not cause an increase in merges for Q-*en* in French, since *en* is a clitic and is therefore always dependent on the finite verb. It does not scramble but cliticises in a single step to the pre-verbal position. As mentioned, we follow Jakubowicz here and do not count other operations that do not relate to the pronouns themselves.

4.3 Cross-linguistic syntactic complexity

Given the properties of *er* and *en* as described above, we can now evaluate what these similarities and differences mean for our cross-linguistics comparison. We have seen that both pronouns share similar derivational complexity, and that the same number of obligatory steps seems to be needed in French and in Dutch to make sentences with prepositional pronouns and quantitative pronouns grammatical and acceptable. We therefore predict the following:

| P5: | adjacent P-*er* | = | P-*en* |

| P6: | adjacent Q-*er* | = | Q-*en* |

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5. Methodology

As should be clear at this point, this study investigates the order of emergence of the various *er* and *en* pronouns to discover whether the syntactic complexity of the different derivations has an influence on emergence in monolingual language development, and whether there are cross-linguistic differences.

We used CHILDES (MacWhinney 2000) to compose a dataset consisting of 206 spontaneous speech files from seven normally developing and longitudinally followed Dutch L1 children (Groningen corpus, Bol 1995) and 213 spontaneous speech files from seven normally developing and longitudinally followed French L1 children (Lyon corpus, Demuth and Tremblay 2008, and Paris corpus, Morgenstern and Parisse 2007). We analysed the presence of the pronoun *er* in all Dutch files and *en* in all French files.

Participants

We looked at all recordings in the spontaneous speech of Dutch children between the ages of 1;6 and 3;7 years and of French children between the ages of 0;11 years and 3;3 years. Recordings took place on an average basis of twice a month. See Table 2 for an overview.[11]

	Children		First recording	Final recording	Nr of recordings
Dutch	Tomas	Age in months	19	37	26
		MLU	1	3	
	Peter	Age in months	18	32	26
		MLU	1	3	
	Josse	Age in months	24	40	28
		MLU	1	3	
	Iris	Age in months	25	42	22
		MLU	1	2.5	
	Abel	Age in months	22	40	28
		MLU	1	3.5	
	Daan	Age in months	20	39	34
		MLU	1	2.5	
	Matthijs	Age in months	25	43	42
		MLU	1.5	3.5	
French	Anaïs	Age in months	12	36	38
		MLU	1	2.5	

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[11] Of the Dutch children, Josse, Iris, Abel, Daan and Matthijs' files were also studied by Van Dijk and Coopmans (2013). Sleeman and Hulk (2013) studied the Dutch children Abel, Daan and Matthijs, and the French children Anaïs, Marie, Nathan and Theotime on the production of pronouns, but only in five files for each child: at the ages 1;8, 2;0, 2;4, 2;8, and 3;0.

Marie	Age in months	12	37	36	
	MLU	1	3.5		
Nathan	Age in months	12	36	41	
	MLU	1	2		
Theotime	Age in months	11	36	40	
	MLU	1	3		
Antoine	Age in months	17	36	27	
	MLU	1	3		
Leonard	Age in months	20	38	14	
	MLU	1	3.5		
Anae	Age in months	18	39	17	
	MLU	1	3		

Table 2. Quantity of recordings used. Age is presented in months.

Besides age, for all children the mean length of utterance (MLU) ratio was calculated per recording using the CLAN programme in CHILDES: the MLU is similar among all children, around 1.0 for the first recording to approximately 3.0 for the last recordings.

Counting

Using CLAN, we calculated per participant and per recording the number of utterances containing an *er* pronoun or an *en* pronoun.[12] Next we assigned each individual instance to one of the following categories: adjacent and non-adjacent constructions with prepositional complements of verbs, and adjacent and non-adjacent constructions with a quantitative pronoun.[13,14]

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[12] We also checked for *er*'s allomorphs *d'r* and *'r* in the Dutch files. In the French files we also counted *en* preceded by an elided first, second, or third person pronoun (*m'en*, *t'en*, *l'en*), a reflexive pronoun (*s'en*), or an elided negation (*n'en*).

[13] Omissions in both languages were not counted for practical reasons: omitted words cannot be entered and filtered out of the text by using the CLAN programme. Exact repetitions have also been excluded, unlike Van Dijk and Coopmans, because we opine that if a sentence with a certain pronoun is repeated multiple times, and counted as new single instances, this causes a distorted view on real production. Cases of doubling were not found in the French data, neither in prepositional *en* nor in quantitative *en*. In Dutch, cases of doubling were only found in prepositional sentences. Doubling stands for *er + er* constructions (not for *er + full NP* constructions), in which the pronoun *er* appears in both the adjacent and in the non-adjacent position. An example from the corpus is **kan er niet eruit* 'It cannot go out', uttered by Abel (2;10). This happened sixteen times in total at an average age of 2;8. The fact that in Dutch sentences with prepositional complements doubling constructions occur, indicates that the use of *er* is not always syntactically correct, until at least a couple of months after its emergence.

[14] Although *erbij* in *erbij zijn* 'be present' and *erbij kunnen* 'to be able to reach' might be considered a P-*er*, because *bij* can also introduce a complement of the verbs *kunnen* and *zijn* with the same meanings, we counted *erbij zijn* and *erbij kunnen* as fixed expressions. Fixed expressions are not included in the data analysis.

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6. Results

We follow Van Dijk and Coopmans (2013) in the presentation of our results (but recall that Van Dijk and Coopmans did not make a distinction between adjacent and non-adjacent P-*er* and Q-*er*). Not all constructions that we looked for were found in the data files: prepositional complements of nouns and complements of adjectives were produced in neither Dutch nor French. As a result, Table 3 only shows results for prepositional complements of verbs and quantitative pronouns. This table provides an overview of the ages of first emergence (FE), as well as the quantity of *er* utterances – presented as an absolute number– per construction and per child. Age is presented in 'number of years; number of months'. We refer the reader to Appendix A for a table containing the percentages, as well as information regarding other types of *er* and *en*. Appendix B offers a graphical representation of the Dutch and French data.

Child		Total utterances	P-*er* adjacent	P-*er* non-adjacent	Q-*er* adjacent	Q-*er* non-adjacent
Tomas	Age in months		2;6	2;6		2;8
	MLU		2	2		2.5
	Absolute number	*8423*	*46*	*3*		*1*
Peter	Age in months		2;1	2;4		
	MLU		2	3		
	Absolute number	*8305*	*54*	*13*		
Josse	Age in months		2;0	2;6	3;0	3;2
	MLU		1	2	3.5	4
	Absolute number	*11695*	*103*	*8*	*6*	*1*
Iris	Age in months		2;5			3;3
	MLU		1			2.5
	Absolute number	*8711*	*17*			*1*
Abel	Age in months		2;3	2;5	2;4	2;4
	MLU		2	2	2	2
	Absolute number	*10804*	*99*	*14*	*6*	*5*
Daan	Age in months		2;0	2;4	3;0	2;4
	MLU		1	2	3	2
	Absolute number	*14600*	*80*	*14*	*2*	*4*
Matthijs	Age in months		2;5 (1;11)	2;9	3;7	3;5
	MLU		2	2	3.5	3.5
	Absolute number	*19569*	*116*	*15*	*1*	*1*
Average age			**2;2**	**2;5**	**2;10**	**2;9**
Average MLU			**1.5**	**2.1**	**3.0**	**2.8**

Table 3. First emergences of P-*er* and Q-*er*.

By focusing on P-*er*, we observe that all children produced adjacent P-*er*, as in (16), and all children but Iris produced non-adjacent P-*er*, as in (17).

(16) a.   *komt eruit*   (Abel, 2;10)

comes ER out

'It comes out.'

    b.   *ga eraf*   (Josse, 2;4)

go ER off

'Go off.'

(17)   a.   *die moet er niet in*   (Matthijs, 2;9)

that must ER not in

'That one does not have to be put in.'

    b.   *die moet er weer in*   (Peter, 2;4)

that must ER again in

'That one must be put in again.'

Note that Iris also failed to produce any non-adjacent variants of the prepositional pronoun when an extra constituent was present.

If we focus on the ages at which both constructions emerge, it becomes clear that all children start with the production of adjacent prepositional complements in sentences without an extra constituent between the finite verb and the preposition.[15] Then, non-adjacent prepositional complements emerge. Looking at the average ages of emergence and average MLU's by all children, we observe the following generalization:

➢ adjacent prepositional complements in sentences without an extra constituent

(average age 2;2, MLU 1.5)

➢ non-adjacent prepositional complements in sentences with an extra constituent

(average age 2;5, MLU 2.1)

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[15] In Matthijs' files the prepositional pronoun *er* emerges at 1;11 (die *er*op, 'that one on it') but is used only once until 2;5, then it appears on a frequent basis. In the files of the other children there is not such a big gap between the subsequent occurrences of the same type of pronoun.

Our data show that adjacent prepositional complements emerge earliest in sentences without an extra constituent; the absolute numbers indicate that they are also used more extensively in these contexts.

Now let us turn to Q-*er* as represented in Table 3. Here it is obvious that various children – Peter, Tomas and Iris – did not produce any adjacent quantitative pronouns in sentences without an extra constituent, such as Daan does (18).

(18) *daar ligt er één*   (Daan, 3;0)
       there lies ER one
       'There lies one.'

Peter is the only child who also does not produce non-adjacent quantitative pronouns in sentences with an extra constituent, such as Abel does in (19).

(19) *ik heb er maar twee*   (Abel, 3;0)
       I have ER only two
       'I only have two.'

We notice that Q-*er* emerges relatively late: more than half a year later than adjacent P-*er* and some months later than non-adjacent P-*er*. Again, a separate analysis of 'omission' of the quantitative pronoun is not included in this paper as stated in footnote 13.

The emergence of the non-adjacent quantitative pronouns in sentences with an extra constituent (at the average age of 2 years and 9 months), as in (20), occurs at approximately the same age as the adjacent quantitative pronouns in sentences without an extra constituent (at the average age of 2 years and 10 months), as in (21).

(20) *ik heb er ook één*   (Daan, 3;1)
       I have ER too one
       'I have one too.'

(21)   *ik mag er eentje pakken*   (Daan, 3;1)

I can ER one get

'I can get one.'

However, the exact order differs per child: one of them – Josse – produces the adjacent quantitative pronouns in sentences without an extra constituent earliest, while Daan and Matthijs produce the non-adjacent quantitative pronouns in sentences with an extra constituent earliest. Abel produces both constructions at exactly the same time. Looking at the average ages of emergence and average MLU's by all children, we observe the following generalization:

➢ non-adjacent quantitative pronouns in sentences with an extra constituent

(average age 2;9, MLU 2.8)

➢ adjacent quantitative pronouns in sentences without an extra constituent

(average age 2;10, MLU 3.0)

Both constructions emerge at the same time, at a similar MLU, and according to the absolute numbers they occur to a similar degree.

Table 4 presents the number of occurrences of French sentences with P-*en* constructions and Q-*en* constructions. This table makes no distinction between adjacent and non-adjacent constructions, as this distinction does not exist in French, as explained earlier: in French the pronoun always cliticises directly onto the verb.

Child		Total utterances	P-*en*	Q-*en*
Anaïs	Age in months			1;11
	MLU			1.5
	Absolute number	*16162*		*26*
Marie	Age in months			1;10
	MLU			1.5
	Absolute number	*10197*		*36*
Nathan	Age in months			2;5
	MLU			1.5
	Absolute number	*5488*		*6*
Theotime	Age in months			1;11

			1.5
	Absolute number	*13103*	*29*
Antoine	Age in months		2;2
	MLU		1.5
	Absolute number	*7388*	*5*
Leonard	Age in months		2;0
	MLU		2.5
	Absolute number	*5182*	*7*
Anae	Age in months	2;11	2;1
	MLU	3	2.5
	Absolute number	*6473*	*1*	*13*
Average age		**2;11**	**2;0**
Average MLU		**3**	**1.8**

Table 4. First emergences of P-*en* and Q-*en.*

The quantitative pronoun was found in the production of all children in French. This was not the case for sentences with a complement *en* to a verb, which was exclusively uttered by one child - Anae – who produced it in a conversation about playing the piano:

(22)   *moi j'en joue*   (Anae, 2;11)

      me I EN play

      'I play it.'

It is therefore entirely clear that all children (including Anae) start with the production of Q-*en*, while the prepositional complement emerges much later (average age of emergence and MLU cannot be given due to insufficient production of this construction). This results in the following generalization in French:

➢ quantitative pronouns   (average age 2;0, MLU 1.8)

➢ prepositional complement

From a cross-linguistic perspective, the acquisition patterns of both constructions differ in one glaringly obvious way: French children start with the production of quantitative pronouns, while Dutch children start with the production of prepositional complements. In both languages the construction that emerges earliest is also uttered the most extensively: in French there is a single instance of a sentence with a prepositional complement and in Dutch the quantitative pronoun is in quantitative respect an ancillary construction.

7.   Discussion

In this corpus-based study we investigated and compared the age of emergence of two specific types of *er* and *en* pronouns in the spontaneous speech of monolingual Dutch and French children. Our overall finding is that some pronouns appear sooner than others, i.e. not all pronouns emerge simultaneously. Interestingly, when these pronouns were uttered it was done mostly correctly: we detected some cases of doubling in Dutch but in neither of the languages were pronouns inappropriately left in situ or used in an otherwise syntactically unacceptable fashion.

Based on the hypothesis that an increased number of movements results in increased syntactic complexity, which in turn entails a later age of emergence, we proposed several predictions. For Dutch these were:

(P1)   Adjacent prepositional complements emerge before non-adjacent prepositional complements in sentences with an extra constituent.

This prediction is confirmed by the results of our study. Adjacent prepositional complements in sentences without an extra constituent emerge earliest, around 2 years and 2 months (MLU 1.5). In sentences containing an extra constituent, non-adjacent prepositional complements appear around 2 years and 5 months (MLU 2.1). This order of emergence is found in the data of all children, apart from Iris – who only produces adjacent P-*er* – and Tomas, whose adjacent and non-adjacent P-*er* emerge simultaneously. Sentences without an extra constituent are grammatical after two merges, while three merges are needed in order to correctly construct sentences with an extra constituent. Therefore, we draw the conclusion that syntactic complexity plays a role in this specific order of emergence.

(P2)   Adjacent quantitative pronouns emerge before non-adjacent quantitative pronouns in sentences with an extra constituent.

Our second prediction was that all further movement – after the obligatory initial two steps – increases the derivational complexity. As a result, we predicted the order of emergence as

stated in P2. This prediction does not seem to be borne out: non-adjacent quantitative pronouns in sentences with an extra constituent and adjacent quantitative pronouns in sentences without an extra constituent emerge around the same time, respectively at 2 years and 9 months (MLU 2.8) and at 2 years and 10 months (MLU 3.0). However, the fact that quantitative pronouns emerge much later than P-*er*, and the fact that adjacent and non-adjacent Q-*er* emerge at the same time, might suggest that even adjacent Q-*er* is a three-step operation, just like non-adjacent Q-*er*. Thus, three steps are obligatory in both sentence types.

The suggestion that Q-*er* involves three obligatory steps instead of two obligatory steps followed by an optional one may be supported by the fact that adjacent Q-*er* never occurs in sentences without a verb, contrary to adjacent P-*er*:

(Mother talking to the cat, who hesitates to go outside)

(23)   *Erin of eruit*?
          'In or out?'

(Father: *Hoeveel wil je er?* 'How many do you want?')

(24)   a.   **Er twee of er drie?*
                   ER two or ER three
         b.   **Er twee of drie?*
                   ER two or three
         c.   *Twee of drie?*
                   two or three?
         d.   *Wil je er twee of drie?*
                   want you ER two or three
                   'Do you want two or three?'

Based on this theory, Q-*er* moves to a position immediately preceding its licensor (comparable to P-*er*), but cannot stay in this position because of its incapacity to cliticise onto the quantifier. Instead, Q-*er* seeks an appropriate host to "lean" on, which is the verbal constituent on its left. Once non-adjacent P-*er* has emerged in child language, this obligatory third step in Q-*er* can develop (in both adjacent and in non-adjacent Q-*er* constructions). This rationale

influences our previous claim as stated in section 4.1: the third step is no longer optional, but obligatory in adjacent and non-adjacent Q-*er* constructions.

(25)

Original	→	Hij heeft twee knikkers gekocht	'He bought two marbles.'
Step 1	→	Hij heeft twee er gekocht	
Step 2	→	Hij heeft (gisteren) er twee gekocht	
Step 3	→	Hij heeft er (gisteren) twee gekocht	

The principle that both adjacent and non-adjacent Q-*er* require three obligatory steps, whereas in the case of P-*er* the third step is optional, is further supported by the fact that the children in our dataset never produce the order "extra constituent - Q-*er*", whereas they do produce the order "extra constituent - P-*er*", see (26). That is, if a sentence is created with Q-*er* and with an extra constituent, Q-*er* is never left in the position immediately preceding its licensor, see table 5:

(26)   *ik kan ze al eruit doen*   (Matthijs, 2;11)

      I can them yet ER out do

      'I can get them out already.'

Child		P-*er* (adjacent) (extra constituent)	Q-*er* (adjacent) (extra constituent)
Tomas	Age in months	2;8	
	MLU	2.5	
	Absolute number	8	
Peter	Age in months		
	MLU		
	Absolute number		
Josse	Age in months	2;7	
	MLU	2	
	Absolute number	3	
Iris	Age in months		
	MLU		
	Absolute number		
Abel	Age in months	3;0	
	MLU	3	
	Absolute number	1	
Daan	Age in months	2;5	
	MLU	2	
	Absolute number	5	

Matthijs	Age in months	2;11
	MLU	2.5
	Absolute number	35
Average age		**2;7**
Average MLU		**2.4**

Table 5. Order Dutch sentences "extra constituent P-*er* / Q-*er*"

Although the children do not produce it, the order "extra constituent − Q-*er*" is marginally acceptable in their target language. This shows that there is a landing site for *er* immediately preceding the quantifier, although it is preferably not a permanent landing site, see (27) taken from the internet:

(27)   ?? *Ik heb   maar er   twee teruggezien.*

       I   have only ER two   back-seen

       'I have only seen two back.'

We have used our acquisition data to argue that adjacent Q-*er* involves three obligatory steps instead of two. This means that the child data helped us to determine the number of steps in a derivation, which we could not determine on the basis of the target language data or the literature. If adjacent Q-*er* involves three steps instead of two, our reformulated prediction 2 is borne out:

(P2)'   Adjacent quantitative pronouns emerge at the same time as non-adjacent quantitative pronouns in sentences with an extra constituent.

The revised number of steps in adjacent Q-*er* constructions also has consequences for prediction 3, formulated for Dutch:

(P3)   Quantitative pronouns will emerge simultaneously with prepositional complements.
(P3)'   Quantitative pronouns will emerge after prepositional complements.

Whereas P3 is not borne out, P3' is: prepositional complements emerge on average and also on an individual level earlier than quantitative pronouns. The constructions with prepositional

complements (that involve two steps) emerge on average around 2 years and 2 months, while constructions with quantitative pronouns (that involve three steps) emerge on average around 2 years and 10 months. This outcome is in line with the findings of Van Dijk and Coopmans (2013).

For French, we predicted the following:

(P4)   Prepositional complements emerge simultaneously with quantitative pronouns

This prediction is undoubtedly disproven. Quantitative constructions emerge at a relatively early age (around 2 years and 0 months), before any other *en* construction, while only one instance of a prepositional complement had been found, at a relatively late age (2 years and 11 months). Therefore, the average data of all children prove this assumption false.

Now that we have discussed the role of syntactic complexity per language, these outcomes will serve as the basis for cross-linguistic comparisons. We made two cross-linguistic predictions.

(P5)   Prepositional complements in French emerge simultaneously with prepositional complements in Dutch.

Regarding prepositional complements we have to keep in mind that French prepositional *en* can only be compared with a small subset of the Dutch prepositional pronouns (*ervan, erover*).[16] When we compare these, we see that Anae uttered the only French prepositional complement at 2 years and 11 months with the sentence *moi j'en joue* (see (22)), and the Dutch variant *ervan* was uttered, also once, by Abel at 2 years and 10 months, see (28).

(28)   *je weet niets ervan*

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[16] In section 2 we showed that P-*er* in Dutch and P-en in French have diverse characteristics and are therefore difficult to compare. Whereas P-*er* is able to occur with all pronouns, P-en only replaces *de* 'of'-complements. Complements introduced by locative prepositions are replaced by the pronoun *y* or by the adverbs *dessus* 'above' or *dessous* 'under'.

you know nothing ERof

'You know nothing about it.'

This age of emergence is comparable, but due to the limited number of instances further experimental research is needed.

(P6)   Quantitative pronouns in French emerge simultaneously with quantitative pronouns in Dutch.

If Q-*er* involves three obligatory steps instead of two, as we argued earlier, this prediction needs to be revised. Notice that for Q-*en* an extra step cannot be motivated. After pronominalisation, Q-*en* moves in one step to its verbal host.

(P6)'   Quantitative pronouns in French emerge earlier than quantitative pronouns in Dutch.

This reformulated prediction is borne out. French constructions with a quantitative pronoun emerge on average around 2 years and 0 months, while Dutch constructions with a quantitative pronoun emerge on average around 2 years and 9 or 10 months. The data show that, on an individual level, nearly all of the French children precede the Dutch children in the production of quantitative constructions, except for Nathan, whose first emergence of Q-*en* is at 2 years and 5 months, while Abel and Daan produce Q-*er* at 2 years and 4 months. This outcome is in line with the findings of previous studies (Sleeman and Hulk 2013; Van Hout et al. 2010; Gavarró et al. 2010).

In summary, we studied the emergence of prepositional and quantitative pronouns in French and Dutch, both separately and comparatively. Our acquisition data led us to revise three of our six predictions, which were then borne out. Ultimately, only one prediction was not borne out: quantitative pronouns appear before prepositional pronouns in French. In order to account for this relative occurrence, we have suggested that this might be explained by the fact that in French prepositional complements of verbs introduced by *de* 'of' are not as omnipresent as quantitative pronouns are. This results in the assumption that young L1 learners do not

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frequently hear this construction and consequently it is unlikely that they will produce them as much as constructions that are widely available in their input. This suggestion is supported by a quick child directed speech search that made it obvious that French parents use quantitative pronouns far more often than *en* as the complements of a verb. The same holds for Dutch: parents use *er* as the complement of a verb more frequently than *er* as a quantitative pronoun. Although this Dutch result could be explained by syntactic complexity alone, we nonetheless believe that a frequency effect reinforces this particular finding.

8.   Conclusion

The results of this corpus-based study shed light on the emergence in child language of syntactically different *er* pronouns in Dutch and *en* pronouns in French, and the role that complexity plays in this order of emergence. We have argued that it is not always possible to determine how many steps are needed in a derivation on the basis of the target language, because the Dutch syntactic Q-*er* movement that we considered to be optional was in fact not. As a result, it were the data themselves that forced us to redefine our initial hypotheses, which were then (apart from one) all borne out. All hypotheses concerning the Dutch language and all cross-linguistically based hypotheses came to pass: adjacent P-*er* emerges before non-adjacent P-*er*, Q-*er* emerges after P-*er*, adjacent and non-adjacent Q-*er* emerge simultaneously, P-*en* and P-*er* emerge simultaneously, and Q-*en* emerge before Q-*er*. The only hypothesis that is not borne out is that French P-*en* emerges simultaneously with Q-*en*, because the data clearly reveal that P-*en* emerges later than Q-*en*. We have attributed this later emergence of P-*en* to the fact that it only replaces *de* 'of' and the complement, which would also account for its low frequency in child-directed speech and (hence) in the child data.

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Appendix A Quantity in percentages of target utterances per construction[17]

DUTCH

	Total	P-*er*		Q-*er*		Expressions	Other
		adj	non-adj	adj	non-adj		
Tomas	8423	0.56%	0.04%		0.01%	0.05%	0.07%
Peter	8305	0.67%	0.16%			0.02%	0.07%
Josse	11695	0.89%	0.07%	0.06%	0.01%	0.03%	0.23%
Iris	8711	0.20%			0.01%	0.03%	0.05%
Abel	10804	0.95%	0.13%	0.06%	0.04%	0.06%	0.31%
Daan	14600	0.54%	0.10%	0.02%	0.04%	0.01%	0.10%
Matthijs	19569	0.59%	0.08%	0.01%	0.01%	0.03%	0.11%

FRENCH

	Total	Q-*en*	Complement en	Expressions	Preposition
Anaïs	16162	0.16%		0.01%	0.09%
Marie	10197	0.37%		0.05%	0.13%
Nathan	5488	0.11%		0.09%	0.05%
Theotime	13103	0.21%		0.29%	0.63%
Antoine	7388	0.07%		0.03%	0.20%
Leonard	5182	0.14%		0.19%	0.25%
Anae	6473	0.20%	0.03%	0.11%	0.20%

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[17] For example, if the total number of utterances for a specific file for a specific child was 100 and among those 100 utterances we found 5 with a quantitative pronoun we counted this as the absolute number of 5 and as 5%, meaning that 5% of all utterances in this specific file contains a quantitative pronoun.

Appendix B Graphical representation of individual age of emergence per target construction

Age of emergence in years per child per Dutch construction
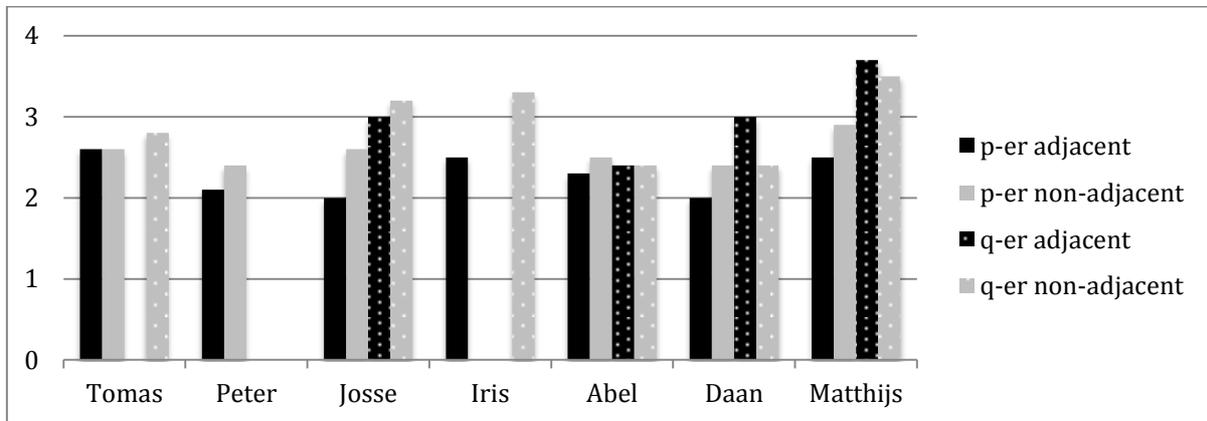
Age of emergence in years per child per French construction